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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Scientific Santa

See Page 326

A SCIENCE SERVICE PUBLICATION

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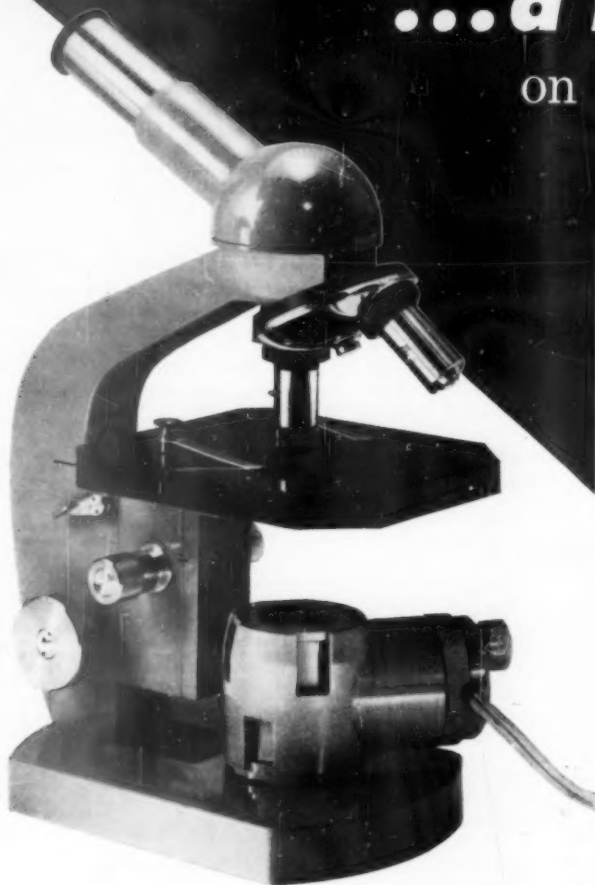
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ASTRONAUTICS

Propose "Space Ferry"

TWO AIRCRAFT companies report joint development of a space ferry for carrying men and materials out to space stations.

Lockheed and Hughes Aircraft companies said the design has been proposed to Government agencies, and that it could be ready by 1965 or 1966.

In operation, it would consist of a pyramid-like package attached to the nose of a powerful, three-stage, automatically programmed booster rocket. The booster rocket would put the space ferry into orbit 300 to 500 miles above the earth.

At this point, the pyramid would begin unfolding until it had exposed 1,000 square feet of wing surface. It would then look like a huge arrowhead. Nestled between the two wings, like the body of a bee, would be a payload capsule carrying 14,000 pounds of construction materials, a pilot and three passengers.

By controlling a 7,500-pound thrust-throttleable engine and by using 12 small reaction rockets spaced on the wings, the pilot would maneuver the vehicle until con-

tact was made with the space station. He would be aided by radar and other navigational instruments.

Meanwhile on earth, a ground crew could be preparing another capsule to be carried up on the next "flight."

After completing its mission, the space ferry would then be piloted back toward the earth. It would enter the earth's atmosphere, withstand 2,500-degree-Fahrenheit temperatures during reentry, and land gently at speeds below "those of existing airlines," said Lockheed's vice president Burt C. Monesmith, and Hughes' vice president Roy E. Wendahl.

A new payload capsule then would be attached and the vehicle readied for its next flight. Flights would be routine enough to be timetabled, the men indicated.

The space ferry also could be used for tracking and inspecting unidentified objects in space, for "sweeping" derelicts from spacelanes and for scientific and training purposes.

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ASTRONOMY

Date Stellar Clusters

WHITE DWARF stars, which have densities so high a cubic inch of such a star might weigh up to 100 tons, indicate the ages of the clusters of stars in which they are found.

They tell ages because these rare stars are dying ones, the last visible stage in stellar evolution, Dr. Willem J. Luyten of the University of Minnesota reported.

He told a joint meeting, in Pittsburgh, of two local chapters of the Society of Sigma Xi that white dwarfs were discovered only about 40 years ago, and that their importance was becoming greater every year. He said finding such stars, which are no larger than a planet but with a mass

nearly that of the sun, caused a minor "revolution" in astronomical thinking.

According to all theories current at that time, Dr. Luyten pointed out, this kind of star simply could not exist. White dwarfs remained a mystery until the late Sir Arthur Eddington explained that they were matter in the raw, collapsed atoms.

Such stars provide a test for Einstein's theory of relativity, and allow the study of matter under conditions that cannot be duplicated on earth.

The University of Pittsburgh chapter and the Carnegie Institute of Technology chapter sponsored the joint meeting.

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BIOCHEMISTRY

Meter Tests Drunkenness

FASTER and more accurate drunk-driving tests are possible through the use of an instrument already widely used in the chemical, petroleum, and food industries.

The instrument is the vapor fractometer, based on an analytical technique known as gas chromatography. Dr. Melvin Haley, visiting professor of biochemistry at the University of Southern California and consulting toxicologist to San Bernardino and Riverside Counties, suggested using the device as a more positive test of intoxication.

"Operated under laboratory conditions by trained personnel," Dr. Haley said, "methods presently used give a fairly reliable indication of the quantity of alcohol in the

blood. But, as the techniques are now applied, there are simply too many opportunities for serious inaccuracies to creep into the results for these methods to be acceptable as legal evidence."

Law enforcement authorities, he said, are encountering increasing difficulty in getting convictions for drunk driving because defense attorneys can often successfully attack the validity of intoxication tests.

Dr. Haley claimed the gas chromatography technique can automatically deliver three detailed and highly accurate profiles of a blood sample in less time than present procedures require to obtain a single and therefore less reliable analysis.

The chromatography process involves nothing more than injecting samples of a person's blood, urine, or breath into the fractometer, he said.

Patrol officers would make the same simple field test they now use on a suspected driver and, if the results are positive, bring him to the police station where the sample would be taken. This would be delivered to the laboratory and a test made.

Running through three samples, he said, would take less than a half hour compared with more than an hour for one test.

The vapor fractometer is manufactured by Perkin-Elmer Corporation, Norwalk, Conn.

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PUBLIC HEALTH

Smokers' Lung Cancer Low

A study of white South Africans, long recognized as the heaviest cigarette smokers in the world, establishes they have a lower lung cancer mortality than others who smoke less.

THE GROUP of persons long recognized as the heaviest cigarette smokers in the world have been found to have a significantly lower incidence of lung cancer than the British, whose incidence is extremely high.

The white South African has long been the highest consumer of packaged cigarettes in the world, Dr. Geoffrey Dean of Provincial Hospital, Port Elizabeth, South Africa, says.

He found the average white South African male 35 years of age or older smoked approximately 24 cigarettes per day. This includes not only city but rural smokers, he reports in the *British Medical Journal* (Oct. 31).

Dr. Dean compared this group's mortality rate from lung cancer with that of a group of British immigrants. He found that deaths due to lung cancer among British immigrants between the ages of 45 and 64 were 44% higher than among white native-born South African males of the same age range.

The investigator then asked himself if the greater mortality among the immigrants could be due to differences in the tobaccos used in cigarettes made in each country. He discovered that the tobaccos used in cigarettes in both countries are flue-cured just as they are in the United States. Those differences that were found between the

cigarettes were not considered by Dr. Dean as significant in causing lung cancer.

Furthermore, many of those immigrants who died from lung cancer came to South Africa in their twenties, and those who smoked cigarettes before emigrating would have smoked British cigarettes for only a few years, he reasoned.

There were, however, great differences between the tobaccos used in cigarettes manufactured in other European countries before the last war. Consequently, if differences in the tobacco were important, one might expect a considerable difference in the mortality rate from lung cancer between South African men and immigrants from countries other than Great Britain. Yet there is no significant difference, he says.

In fact, the cigarette smoked by the South African resembles the cigarette puffed by an American, and both experience virtually the same incidences of lung cancer which are much less than in Great Britain.

This led Dr. Dean to conclude that those immigrants who died of lung cancer before age 65 were exposed to the cause or causes before they left Britain.

Despite the cheerful news for South African smokers, the study also revealed that while deaths due to lung cancer are considerably lower than in Britain, the death rate from this disease has doubled

in South Africa during the ten-year period between 1947-1956. This increase is unlikely to be due to improved diagnostic facilities, but rather, he suggests, it appears to be a genuine increase.

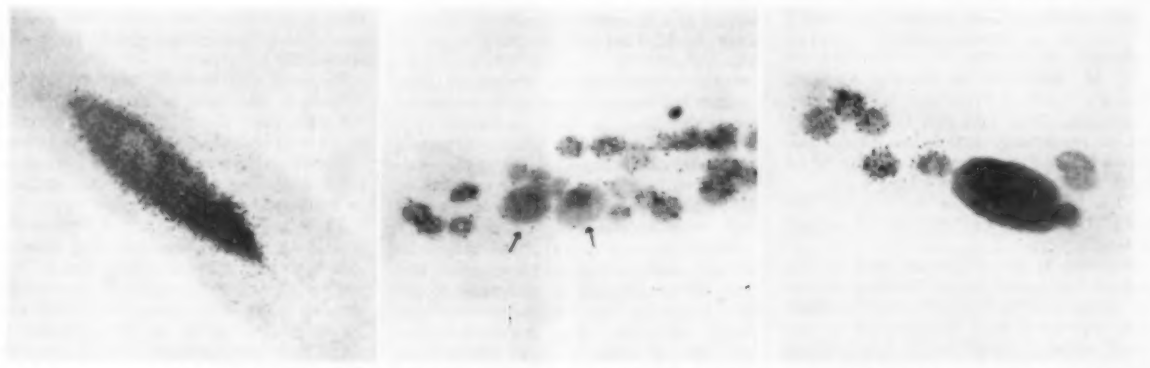
This increase has followed the rapid industrialization and growth of cities within the past 40 years, he noted. Both the country and city dwelling white male South African smoke approximately the same amount of cigarettes. Yet, the increase in mortality is much higher in large cities than in rural areas, he points out.

For instance, the male lung cancer death rate in the city of Durban is higher than the corresponding rate in any other city in South Africa. This applies to both native-born and immigrants. Cigarette consumption in Durban is no higher than elsewhere in South Africa. Yet, during the ten-year period 1947-1956, the death rate from lung cancer among British immigrants in Durban between the ages 45 and 64 was more than five times higher than the rate among the native-born living in rural districts.

Pointing the finger of guilt at air pollution, Dr. Dean says that Durban has a hot humid climate. It has fewer sunny days in the year than the other South African cities. The smoke in Durban per cubic meter compares with districts of London, he says.

Thus he concludes that the higher incidence of lung cancer among residents in South African towns, and in Durban particularly, as compared with the incidence among residents in rural areas, would seem to be strong evidence that atmospheric pollution is an important factor. If so, it is equally likely that the higher incidence among the more recent British immigrants, may again be connected with the air they breathed before emigrating.

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TAGGED PARAMECIUM—Labelled with the radioactive form of hydrogen called tritium, nucleic acid is traced through a reproductive process known as autogamy in the one-celled animal paramecium in this series of photographs made at Indiana University by Prof. W. J. van Wagendonk, biochemist, and John Berech Jr., predoctoral fellow of the National Institutes of Health. The photo (left) shows tritium taken up by the cell's macronucleus during the growth process. In the middle picture, made just before cell division, the macronucleus has broken down into small fragments and two macronucleus precursors (arrows) have formed, each one of which goes into a new cell at the time of division. The photo (right) shows one of the new cells after division, with remaining radioactive fragments carried over from the parent cell, but with little or no radioactivity in the new macronucleus. This indicates that, in autogamy at least, the cell prefers synthesizing new nucleic acid, rather than utilizing the available old nucleic acid. Prof. van Wagendonk's work has won a grant of \$25,800 from the National Science Foundation for basic research on the complex biochemical processes involved in the reproduction of living cells.

GEOPHYSICS

Dangers to Man in Space

A SERIOUS threat to manned space flight has been discovered: very intense radiation thrown out by the sun during its active periods.

This new radiation makes the hazards of the Van Allen radiation belts, first found by earth satellite instruments, seem pale by comparison. A high level of 10,000 times normal has been measured on one occasion.

The over-all disturbed period, when the ionizing radiation exceeds normal background, lasts from one to eight days.

When one of these solar radiation events occurs, an individual in space within the solar system might be exposed to radiation totaling as much as 1,000 roentgens an hour. Thirty minutes of such exposure would result in a dosage fatal to about half the persons so exposed, according to currently accepted tolerance rates.

During the past few years, this radiation has been observed using different methods by scientists at the State University of Iowa, the University of Minnesota and the Geophysics Institute of the University of Alaska.

At the time of a giant solar flare last May 12, the Minnesota group launched several simultaneous unmanned balloon flights. These revealed a tremendous burst of protons, or hydrogen nuclei, from the

sun, resulting in unexpectedly high amounts of this radiation at balloon altitudes in the earth's atmosphere.

Drs. E. P. Ney, J. R. Winckler and P. S. Freier of the University of Minnesota have proposed that discovery of this radiation may impose the most serious threat yet to manned space flight.

In *Naval Research Reviews* (Oct.), Malcolm D. Ross of the Office of Naval Research warns that manned space flight is not the next logical step following the recent Russian moon rocket feats.

Although shielding is an obvious solution to the problems presented by the "soft" solar radiation, he points out that the amount of material required for adequate protection will impose a "severe weight penalty and may not be a practical" solution.

"We must face facts regarding manned space flight," he reports. "Technical problems can and will be solved as they occur."

"The major new radiation discovery, however, is a recurring natural solar phenomenon, the result of a mechanism and events on the sun" not completely understood.

Since its occurrence cannot be forecast at this time, predictions of manned space flight in the near future appear "quite unrealistic," Mr. Ross concludes.

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METALLURGY

Yttrium for A-Plane

A BLUE-GRAY member of the rare earth family, yttrium, holds promise as a metal for use in an atomic-powered airplane's reactor.

K. M. Bohlander of General Electric's Aircraft Nuclear Propulsion Department, Cincinnati, Ohio, said that the only problem in machining yttrium has been a tendency of small particles to catch fire when sparking occurs at the working point.

This has been solved by flooding the work and cutting tool with an oil coolant, he said.

Scientists at the symposium, held in Chicago and sponsored by the American Society for Metals and the Atomic Energy Commission, also heard how "pinches" of yttrium when added to other metals help increase resistance to oxidation under high temperatures.

Yttrium's most extraordinary effect has been increasing oxidation resistance in iron-base metals containing chromium. A little yttrium added to stainless steel containing 25% chromium gives the metal the same oxidation resistance at 2,500 degrees Fahrenheit as it had at 2,000 degrees, it was reported. Addition of aluminum or thorium further increases oxidation resistance.

Use of yttrium as an alloying agent also improves the workability and physical properties of the metal. The iron-chromium-

yttrium alloy is "readily cold-rolled, easily welded and represents a significant development in high-temperature metallurgy," it was reported.

Other studies showed yttrium removes oxygen and nitrogen from vanadium to improve ductility. In tests, unalloyed vanadium cracked extensively when cold-pressed and cold-rolled. But after 0.5 to two percent of yttrium was added, the metal could be cold-rolled to a thin strip with only slight edge roughness.

General Electric is one of two companies working under a Federal Government contract on development of an atomic reactor for America's first nuclear-powered airplane. Although other rare-earth metals have been investigated, concentration is on yttrium because of its good structural strength and moderate ability to absorb neutrons.

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MISSILES AND ROCKETS

Suggest "Bumpers" For Space Ships

FUTURE SPACE ships should be equipped with "bumpers" to protect them from meteor collisions.

This would cut down the hazard of

meteors in space by a factor of about 100, Dr. Fred L. Whipple, director of the Smithsonian Institution's Astrophysical Observatory, has calculated.

Collisions with some of the many millions of meteors in space will probably not be a major danger in travel outside the earth's atmosphere, Dr. Whipple reported to the Office of Naval Research. He suggested placing an extra skin on the outside of the vehicle, separated by an inch or two from the inner skin.

The meteor, striking the outer skin, will explode there and only the gas vapor will hit the inner skin. The gas vapor does not have the crater-producing power of the meteor and will not cause punctures. Dr. Whipple estimated the cost of space ship "bumpers" would not be much more than automobile bumpers on a relative basis.

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ROCKETS AND MISSILES

NASA Scientists Puzzled By Balloon's "Sparklers"

MYSTERY surrounds the United States space agency's test of a 100-foot balloon on Wednesday, Oct. 28. No one knows what the little sparkling lights were that twinkled around the sphere.

Seen by hundreds of persons, including scientists of the National Aeronautics and Space Administration, the lights sparkled faintly during the brief time the balloon was illuminated by the sun.

NASA reported "there is tremendous scientific interest" in the lights, and two prominent theories as to what they may have been.

One is that bits of the aluminum coating may have flaked off the huge plastic balloon as it was inflated 250 miles above the earth.

The other theory is that the casing may have broken when the balloon was ejected into space, scattering metal fragments around the balloon.

To solve this puzzle, NASA scientists will study photographs made during the balloon's brief flight. The exact number was unavailable, but NASA reported 15 to 20 tracking stations had been alerted to the balloon shot, and that one station alone took 40 or 50 pictures.

These will be examined to determine the size of the sparklers, the paths they traveled and how long they twinkled. Before this can be done, the scientists will have to determine when each picture was taken and where the balloon was at that moment.

No date was mentioned by which time the answer may be known.

NASA definitely ruled out speculation that the balloon carried a network of flashing lights to warn airplanes as it fell through darkness into the Atlantic Ocean. This was unnecessary, NASA said, because range clearance already had been obtained from the Federal Aviation Agency in Norfolk, Va., and no airplanes would have been in the vicinity.

The balloon was launched from Wallops Island, Va., and was believed to have plunged into the ocean 500 miles due east.

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Map Moon's Terrain

THE FIRST topographic map of the moon is now being prepared in this country. It will be used in the selection of eventual landing sites on the moon, as well as in the designing of a lunar surface vessel and telemetering instruments.

The project is being carried out jointly by the U. S. Army Map Service and the U. S. Geological Survey. It was outlined before the Geological Society of America meeting in Pittsburgh by Arnold C. Mason, Maxim M. Elias, Robert J. Jackman and Anabel B. Olson of the Geological Survey, Washington, D. C.

Observatories from various parts of the world have cooperated in the project by providing photographs of the moon. These are being carefully matched to obtain pictures of the same areas from different angles during the moon's libration, or slow, apparent swing of the visible half of the moon's surface.

This libration causes parts near the limb or edge to be alternately visible and invisible, assuring map coverage of about 60% of the lunar surface. It is doubtful whether recent Russian photographs of the other side of the moon will show sufficient

detail to be useful for topographic map-making purposes.

Although many planimetric maps (those that do not indicate elevations) of the moon have been prepared, this new map will be the first topographic map of the moon's surface, Mr. Mason told SCIENCE SERVICE.

The map, expected to be completed by October, 1960, will be at a scale of 1:5,000,000 on a modified stereographic projection. Elevations will be shown by form lines at 1,000-foot intervals. At this scale, the diameter of the moon would represent 50 inches on the map. The moon map will thus be printed on four separate 30-square-inch sheets.

A second map is also contemplated at a scale of 1:1,000,000. This will probably require an additional several years to complete.

The current terrain study of the Geological Survey describes surface features, including slopes, and will include interpretations of the constituents and texture of the moon's surface, and the likelihood of underground openings and caverns.

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ASTRONOMY

Find Nitrogen Tetroxide In Atmosphere of Venus

THE CHEMICAL compound nitrogen tetroxide has been discovered for the first time in the atmosphere of the planet Venus.

Its presence there was detected from an examination of the sun's light reflected from Venus and spread out into its rainbow pattern of colors by a spectrograph at Georgetown University, Washington, D. C. Nitrogen tetroxide consists of two atoms of nitrogen and four of oxygen.

The compound has also been found in Jupiter's atmosphere, and the scientists reporting their Venus studies suspect it is present in the atmosphere of Mars. Finding nitrogen tetroxide in a planet's atmosphere explains previous failures to detect molecular oxygen—the oxygen is locked away in chemical compounds.

No free oxygen has been found in the atmosphere of any planets of the solar system except earth, Dr. C. C. Kiess of Georgetown College Observatory reports. The studies of the spectrum of Venus were made by Dr. Kiess, his wife, Harriet C. Kiess, and Father F. J. Heyden, director of the Georgetown Observatory. Their observations are reported in *Science* (Oct. 30).

They found a wide, continuous absorption band in the violet and ultraviolet region of the Venusian spectrum between about 4,500 and 3,800 angstroms. This structureless band is virtually "identical" with that produced by nitrogen tetroxide gas.

The presence of nitrogen tetroxide on Venus may also account for the color effects, when that planet's atmosphere appears

not pearly white, but yellow, when seen through a telescope.

Their studies were made with the support of the U. S. Army Engineers at Fort Belvoir, Va.

Science News Letter, November 14, 1959

ASTRONOMY

Four "Exploding" Stars Found From Mt. Palomar

FOUR SUPERNOVAE, "new stars" that suddenly blaze forth to several million times their previous brightnesses, have been detected so far this year at Mt. Palomar Observatory.

Supernovae sometimes shine with considerable fractions of the total brightness of the galaxies in which they appear. They are believed to occur at the average rate of one in each galaxy every 300 or 400 years. The last to appear in the Milky Way galaxy in which the sun and its planets, including earth, are located was in 1604.

The four supernovae of 1959 were found by Howard S. Gates and Dr. M. L. Humason, members of a scientific team searching for exploding stars under a program sponsored by the National Science Foundation.

Detection of supernovae is important because of the possibility the blazing stars can be used as yardsticks to measure intergalactic distances.

When enough is known about supernovae, it may be possible for scientists to determine the distances of the galaxies in which they appear from the apparent brightnesses of these "new stars."

Science News Letter, November 14, 1959

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PHYSIOLOGY

Weather Affects Health

EVERY TIME the weather changes, you change too.

At least your body metabolism does, Dr. Rene Dubos of the Rockefeller Institute reported to the National Science Foundation.

Speaking on the topic of "Environment and Disease," the investigator pointed out that weather is one of numerous environmental changes that affect the human body.

For instance, it is a well-established fact that a European wind known as the foehn, which sweeps across Switzerland, southern France and Germany, is closely followed by an increase in incidence of diseases and even auto accidents in those countries.

Such an increase in disease, which includes heart diseases as well as all others, can always be expected to follow any weather change, Dr. Dubos said.

Even the seasons are responsible for many ups and downs in diseases. The number of polio cases is always highest during the summer months. This is always followed by a decline in winter. Dr. Dubos interpreted this as meaning that during the summer we are different animals, metabolically, than in the winter.

Another environmental factor that affects diseases is the amount of crowding humans must endure. True infection spreads by direct contact under crowded conditions, but these conditions can also change the response of the individual to the disease agent as well as can other emotional stimuli, he said.

Striking out at air pollution, the scientist noted that there is a large variety of lichens

growing in the rock formations along the Hudson River Valley. However, the identical rock formations will not support the same lichens in Central Park. Air pollution is one of the largest problems of industrialized society, he stressed.

He then related his experience with a group of mice which were kept in a "very clean," although not germ-free, environment. These he compared with mice of the same breed living in a standard environment. Significant differences included complete survival of all "clean" animals while some standard mice died. The clean mice gained weight faster. When all of the mice were fed a deficient diet, the clean animals continued to gain weight, but at a slower rate. The standard mice lost weight.

However, the clean animals were much more susceptible to bacterial infections. Here he added a word of caution for humans.

"We are manipulating our environment so fast in our technological civilization that we should study and be aware of these changes," he emphasized. He warned that we may become too sanitary, resulting in a weakening of our natural defenses.

Americans keep their children clean, so that they do not get diseases. When they are adults and do finally contract a disease, it hits much more seriously, he said. Perhaps medical science will have to grapple in the not too distant future with a choice: which diseases should people be protected from and which diseases should they be exposed to at an early age.

Science News Letter, November 14, 1959

FORESTRY

Fire Lab Dedicated

THE FIRST national forest fire behavior laboratory, at Macon, Ga., is ready to set fires and let them burn under controlled, scientific conditions.

The U. S. Forest Service is supplying the equipment and staff for the laboratory and will also operate it, Dr. Arthur A. Brown, director of the forest fire research division, Washington, D. C., told SCIENCE SERVICE. The state of Georgia allocated \$375,000 to pay for the building. All that is missing, Dr. Brown said, is some of the key scientists, yet to be named, to head operations.

With the new laboratory, equipped to make accurate measurements of the effects on forest fires of moisture, fuel and winds, scientists hope to learn several things. Among the big forest fire "unknowns" are the effects of upper air conditions (10,000 feet and higher) on ground fires. There is very good evidence of an important relationship, Dr. Brown said. Knowledge of these air conditions may help predict the course of large forest fires.

The scientists also expect to get more information on what reactions to expect from burning southern forest fuels. In the south-

ern states there is often a place for deliberate fires, Dr. Brown explained. Fires are legitimately set to reduce accumulated fuel, prepare seed beds or to control brown spot disease of trees, for example. However, the factors influencing the burning, such as soil and weather conditions, are largely unknown.

For example, it may rain fairly steadily one day, thoroughly wetting the trees and plant growth, yet the next day a forest fire may burn these same forest fuels.

Generally, the scientists at the new laboratory hope to gain more complete understanding of why forest fires behave as they do. With quantitative information, more effective prevention and control methods will be possible, Dr. Brown said. Instead of learning from bitter experience, the scientists will be able to learn from controlled experiments.

The Forest Service hopes eventually to have three fire laboratories in operation. One other is already under construction with Federal funds in Missoula, Mont. A third, in California, is in the planning stage, Dr. Brown said.

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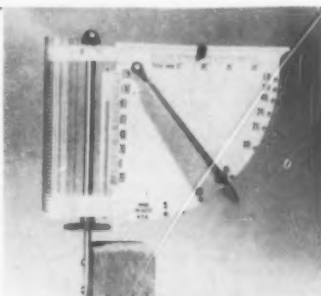
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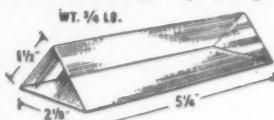
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ASTRONOMY

Interplanetary Particles Seen in Atmospheres

THE DUST particles of interplanetary space may be observed suspended in the atmospheres of the planets Mars and Venus.

Dr. Thomas Gehrels of Indiana University made this suggestion after studying the polarization of light from the two planets and the moon. He found the strongest polarization occurred in the ultraviolet.

This marked effect indicates that the reflected sunlight is being scattered by particles about a hundred-thousandth of an inch in diameter. Dr. Gehrels suggests that these particles may be of the same nature as the micrometeorites found in the earth's atmosphere, according to a report in *Sky and Telescope* (Nov.).

Science News Letter, November 14, 1959

GEOLOGY

Rocks Indicate Australia, Anarctica Were Joined

A DISCOVERY by a New Zealand research team in Antarctica has supported the theory that Australia and the ice-covered continent were once joined.

The team from Victoria University, Wellington, has found samples of dolerite rocks the same age as dolerite rocks from Tasmania.

They explained that dolerite was formed at a certain stage in the earth's development.

The leader of the team, Dr. V. B. Bull, said, "If this is the case, Australia and Antarctica were joined at the time of the formation of dolerite, with Tasmania occupying the northern end of the Ross Sea."

Dr. Bull has made a full report on the discovery to the University Council. He will report further to the International Union of Geodesy and Geophysics Conference in Helsinki, June, 1960.

It is proposed that the 1959-60 New Zealand Antarctic Expedition make a collection of rock samples.

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Questions

ASTRONOMY—How can white dwarf stars date the age of star clusters? p. 316.

CARTOGRAPHY—What value will a topographic map of the moon have? p. 319.

GEOPHYSICS—What new threat to space flight has been discovered? p. 318.

PUBLIC HEALTH—What change in estimates of nuclear fallout appear necessary as a result of some Norwegian studies? p. 324.

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SOCIETY FOR VISUAL EDUCATION, INC., 1345 West Diversey Pkwy., Chicago 14, Ill.—Film-strip Tabloid (Free to teachers, principals, libraries and administrators): Visual Review, describes new materials and methods for improving instruction at classroom level. Quarterly, during 1959-60.

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PSYCHOLOGY

Short Noise Bursts Affect Decision Making

SHORT NOISE bursts of one second, as from the firing of rockets, cause a temporary decrease in the efficiency of men making rapid decisions from visual signals.

How noise distracted 36 men of normal hearing in the age range of 16 to 28 was studied by Dr. Muriel M. Woodhead of the Applied Psychology Research Unit, Cambridge, England. The test subjects matched moving cards with stationary ones by deciding how many symbols were the same on both.

Aim of the first of two experiments was to detect any decrease in work following the one-second burst of recorded sounds of a rocket firing. Dr. Woodhead learned that the noise of rocket firings had a temporary but real effect, decreasing efficiency. The subjects did not merely pause briefly and then continue, but showed a pattern of intermittent gaps in response to the next few demands of the task.

Over the whole task their efficiency was not noticeably lower than that of those taking the test under quiet conditions.

The second experiment was designed to show any variation in effects relative to the intensity of the sound. Dr. Woodhead found that bursts at 95 to 115 decibels caused an efficiency decrease, but that at 85 decibels, the tendency was much smaller.

The report of her studies appears in the *Journal of the Acoustical Society of America* (Oct.), published by the American Institute of Physics.

Science News Letter, November 14, 1959

AERONAUTICS

Space Ideas Pouring in To NASA Invention Board

IDEAS FOR advancing the United States' position in the space race are pouring in from Americans in all walks of life, a National Aeronautics and Space Administration official reports. Someone could win \$100,000 as a reward for a top-notch technical suggestion.

Dr. James A. Hootman, secretary of NASA's Inventions and Contributions Board, said a large percentage of how-to-do-it suggestions are also coming in from foreign countries, especially Italy.

Under the law, NASA's administrator can recommend a cash award up to \$100,000 for an outstanding scientific or technological contribution to aeronautical or space activities. The Board has processed about 1,200 ideas since December, but no award has yet been made.

An oft-submitted idea is for launching a space craft from a mineshaft, sunken tube or inclined track running up a mountain. Steam or compressed air are suggested for "getting the rocket going" before its own expensive fuel is ignited.

Other suggestions concern astronauts, including maintenance of oxygen supplies and improvements in space suits.

Many suggestions, frequently referred to

NASA by the White House, are from high school students.

"Some of their plans are ingenious," Dr. Hootman said. "But more often the suggestion is for something not as good as that which we already have. But in any case, we try to offer constructive answers to queries."

Other suggestions, he said, come from "almost as many sources as there are Americans," including large corporations, their employees, Government workers and university professors.

Ideas from high school students are "as good as those we get from the average citizen," he said, but the best ideas are generally from people having experience in the field.

Dr. Hootman said some of the ideas volunteered have held merit. Many, however, have been too advanced to be fully appreciated at this time. Awards on some of these ideas may be made later when the value can be more accurately assessed, he said.

Science News Letter, November 14, 1959

PUBLIC HEALTH

Nuclear Fallout Drops Sooner Than Believed

FALLOUT measurements taken over Norway indicate radioactive particles from nuclear tests remain in the stratosphere only about half a year, instead of five to ten years as scientists had previously estimated.

This would mean that the worst fallout from the most recent nuclear bomb test a year ago, Nov. 3, 1958, by Russia, has already taken place.

These findings were made by the Norwegian Defense Research Institute and were based on systematic measurements reaching up to 40,000 feet in altitude. They have not yet been officially published, it was learned at the Norwegian Embassy.

The stratosphere, the upper layer of the atmosphere, begins at anywhere from 25,000 feet over the poles to 55,000 feet over the equator. Samples taken from altitudes up to 40,000 feet over Norway were thus well into the stratosphere.

The measurements were made exclusively over Norwegian territory in cooperation with the Norwegian Meteorological Institute and the Air Force. They showed that radioactivity near the ground increased steadily until last May, although no nuclear bomb had been detonated for a half year. During the following months, however, radioactivity levels have dropped just as steadily. Peak radioactivity therefore occurred six months after the last detonation.

Not only should the worst fallout period be over, research director Torleif P. Hvin-den reported, but radioactivity should decrease to an unmeasurable level within the next several years if there are no further bomb tests.

The reason it has now become possible to obtain results contrary to previous belief is largely because measurements have now been made during a time span free of nuclear detonations.

Science News Letter, November 14, 1959

IN SCIENCE

EDUCATION

Develop "Adult Primers" As Reading Aids

"ADULT PRIMERS" have been developed at the University of California, Los Angeles, as remedial reading aids.

Designed for children, adolescents and young adults who have reading problems, a new five-book "Deep Sea Adventure Series" uses a basic but gradually expanding vocabulary to develop adult story lines.

Authors are Dr. James C. Coleman, Frances Berres, Frank M. Hewett and Dr. William Biscoe of UCLA's Psychological Clinic School. Publisher is Harr-Wagoner of San Francisco.

"The series was designed to fulfill a long felt need for stimulating content material to replace the dull 'Fred has a sled' motif of conventional primers," Dr. Coleman says.

"We feel that by offering exciting, adventurous material, presented in books with adult illustrations and format, and yet told simply with a basic vocabulary, we may stimulate the retarded reader. Thus reading may become a pleasure to him, rather than a tiresome, frustrating task."

The series is for individual or classroom use by teachers who do not necessarily have special remedial reading training. It also offers a new type of reading material for modern youngsters who are achieving on schedule in early grades and who may be too sophisticated for the "Fred has a sled" motif.

Vocabulary and comprehension building aids and suggestions for utilizing the series in a variety of situations are included in an accompanying teacher's manual.

Science News Letter, November 14, 1959

METROLOGY

New Scientific Terms for "Very Large" Adopted

TERA, GIGA, nano and pico are new scientific terms adopted to denote very large and extremely small quantities.

The four prefixes are now being used by the National Bureau of Standards. Tera indicates a trillion and giga a billion. Nano is the prefix meaning a billionth and a pico, a trillionth.

These prefixes were adopted by the International Committee on Weights and Measures, and are in addition to the eight now in common use.

The prefixes followed by the multiple or submultiple denoted in figures, are: tera—1,000,000,000,000; giga—1,000,000,000; mega—1,000,000; kilo—1,000; hecto—100; deka—10; deci—0.1; centi—0.01; milli—0.001; micro—0.000,001; nano—0.000,000,001; and pico—0.000,000,000,001.

Science News Letter, November 14, 1959

CE FIELDS

PHARMACOLOGY

New Antibacterial Drug Treats Skin Infections

AN ANTIBACTERIAL drug has proven highly successful in treating almost 90% of patients with a wide variety of skin infections.

The new orally administered drug, whose generic name is furaltadone, is the newest of the synthetically derived nitrofurans, distinct from the antibiotics and the sulfa drugs.

The drug was effective, reported Dr. Alfred L. Weiner of the University of Cincinnati's College of Medicine, in treating 35 out of 40 patients with boils, carbuncles, bacterial skin infections accompanying eczema, acne, cellulitis, and other infections caused by staphylococci.

Besides the 40 patients whose progress was followed carefully, an additional 22 were treated in the short time his investigation has been under way. Initial study of this group indicates results will probably parallel those obtained with the first group of patients.

Such skin infections are one of the most common problems caused by staphylococci resistant to antibiotics, and the incidence of staphylococcal infections being carried from the hospital to the home is on the increase, recent studies have shown.

The incidence of side reactions to the new drug was low, Dr. Weiner reported, with five instances of nausea and vomiting, one of dizziness, and an unusual reaction of rash, fast pulse and difficult breathing in a few patients who had taken alcohol during the drug therapy.

Science News Letter, November 14, 1959

SURGERY

Neck Yields Graft Tissue For Facial Plastic Surgery

A LARGE defect on a patient's face can now be successfully repaired with "borrowed" skin from the patient's neck, two surgeons have found.

Drs. Milton T. Edgerton and F. C. Hansen, both of the plastic surgery division of the Johns Hopkins Hospital, told the American Society of Plastic and Reconstructive Surgery meeting in Miami Beach, Fla., that neck skin matches facial skin well in color and texture and is available in large amounts.

Plastic surgeons have for a long time had trouble finding suitable skin to cover a large facial lesion, such as is created by the removal of a port wine birthmark. When skin which does not match the face is grafted there, the doctors said, the result is little better than substituting one defect for another.

Although skin from one part of the face,

they said, makes an ideal graft for another part of the face, it is only available in limited quantity. Skin can be removed from the neck in a single piece measuring as much as four by eight inches.

Because only the upper layers of the neck skin are cut away, the area regenerates spontaneously, the surgeons explained. A graft only 12 to 14 thousandths of an inch in thickness can be taken, leaving an area which heals almost invisibly.

For male patients, whose neck skin contains visible hair follicles, which would be unsightly on some parts of the face, the surgeons suggest using skin from the smooth bare area under the collarbone.

The use of neck skin grafts will allow surgeons to attempt procedures on the face, particularly with children, which they have had to avoid in the past, they said. Flaps of skin can be moved from the forehead to other parts of the face, with neck skin used to replace the forehead loss.

Although a skin graft is necessarily framed by scar, Drs. Edgerton and Hansen said that with careful planning, scars could be fairly well concealed in natural lines and folds of the face.

Science News Letter, November 14, 1959

GEOLOGY

Earth's Interior Is Cooler Than Previously Believed

TEMPERATURES inside the earth are probably somewhat lower than they were believed to be a few years ago.

Present observations indicate the bottom of the earth's crust to be approximately 900 degrees Fahrenheit, and the outer boundary of the core to be approximately 3,600 degrees Fahrenheit.

These figures were quoted by Dr. John Verhoogen, University of California, Berkeley, at the Sigma Xi Club of Drake University, Des Moines, Iowa. Sigma Xi is a national organization for the encouragement of scientific research.

The origin of the thermal fluctuations that lead to volcanism and mountain building, however, are still obscure, Dr. Verhoogen said. If more could be learned about the temperature distribution within the earth, man's understanding of such geological phenomena would be greatly enhanced.

Temperature distribution could be exactly determined if one knew the earth's surface heat flow, the distribution of heat sources, and the mechanism of heat transfer and relevant thermal conductivity, he said.

The first is known approximately, the second may be surmised if proper assumptions are made regarding the earth's chemical composition, and the third is poorly known.

Temperature at any depth can also be evaluated from phase relationships, such as melting, or from the effect of temperature on elastic properties and density.

The latter method seems most promising, he said, although it still involves "considerable uncertainties."

Science News Letter, November 14, 1959

ENGINEERING

Message System Uses Meteor Trail Reflection

A TWO-WAY message system using radio signals reflected from the ionized air left in the wake of meteors has been successfully developed.

The message to be sent is first recorded on magnetic tape. With both transmitters on the air, the presence of a suitably located meteor trail is detected within a few thousandths of a second.

Then the message is sent, most satisfactorily at 2,400 words per minute, 40 times the speed of present teletype transmission. When the signal strength falls too low, as the meteor trail disappears, the transmission is temporarily halted.

Extensive tests made over an 800-mile path shows the 49-megacycle transmissions can compete effectively with other long-range systems.

The system, developed by the National Bureau of Standards, is relatively free from ionospheric disturbances. However, the simultaneous occurrence of two meteors can cause garbled signals.

In a project known as Janet, Canadian scientists had previously used meteor ionization to aid short-wave radio communications.

The overcrowding of the high-frequency bands normally used for long-range radio communications has stimulated various attempts to use wavelengths so short that ordinarily they would serve only over a line-of-sight path. The report on meteor trails for radio communications appears in *Sky and Telescope* (Nov.).

Science News Letter, November 14, 1959

MEDICINE

Electron Transfer Occurs In Potent Drug Reactions

HOW EASILY a drug gives up its electrons may be a very important factor in how good a drug it is.

Chlorpromazine has "striking biological activity," a team of researchers reports in *Science* (Oct. 30). The drug, which affects the central nervous system, also has "striking properties as an electron donor," they point out.

Its particular tranquilizing action may be due to chlorpromazine's charge-transfer properties, report Dr. G. Karremans of the Eastern Pennsylvania Psychiatric Institute, Philadelphia, and Dr. I. Isenberg and Nobel Prize winner Dr. A. Szent-Gyorgyi of the Institute for Muscle Research, Woods Hole, Mass.

Another drug, d-lysergic acid diethylamide, with strong action on the central nervous system was found to be a very good electron donor. They report serotonin is also good.

Further studies on charge transfer may contribute to understanding of the mechanism of normal and abnormal psychic functions, the scientists conclude.

Science News Letter, November 14, 1959

GENERAL SCIENCE

How to Be a Space-Age Santa

A well-chosen Christmas gift can make an immeasurable difference in a child's life, beginning lifelong understanding and enjoyment of science.

See Front Cover

By SHIRLEY MOORE

SANTA WILL have to be "in orbit" this year if he is going to stuff the stockings of space-age children.

Most of the parents, relatives and family friends who are filling in as Santa's purchasing agents are well aware that science has become exceedingly important to the younger generation. Today's children are surprisingly knowledgeable about the latest electronic marvel, moonshot, or chance of stumbling upon the secret cross-over between life and non-life.

Naturally, then, most of them want to begin right now to fiddle around with the unfinished pieces of scientific discovery. Imaginatively chosen Christmas gifts will give many a child and young person his first exhilarating chance to do so.

Data accumulated by SCIENCE SERVICE show that such gifts are quite likely to result in the sprouting of thousands of brand new scientists under the nation's Christmas trees this year.

Somewhere a six-year-old will unwrap a toy gyroscope that may start him on the long and fairly mysterious process of becoming the director of an inertial navigation instrumentation laboratory. The photograph on the cover of this week's SCIENCE NEWS LETTER shows some of the pleasure two children are receiving from their scientific gifts. A 16-year-old girl sitting on the floor among crumpled tissue and ribbon will open the new set of books that will fire her determination to explore the fascinating realm of mathematics.

SCIENCE SERVICE studies of highly promising student-scientists have turned up impressive evidence that careers in science may begin very early in a person's life and

that a great many of them are started by just the right book or piece of equipment at the time when a youngster is most receptive to its particular delights.

The talented students discovered in the Science Talent Search for the Westinghouse Science Scholarships and Awards and in the National Science Fair, both activities of the national science youth program administered by SCIENCE SERVICE, are especially good examples of what may happen when children are given guided freedom to question, explore and discover answers for themselves.

The parents of the top 40 winners in this year's Science Talent Search have reported to SCIENCE SERVICE the toys, books and equipment they believe to have been most important in stimulating the development of their sons' and daughters' interest and unusual ability in science. There are useful suggestions here for parents, relatives and friends who would like to choose a rewarding Christmas gift for a favorite youngster:

From two or three years old on—jigsaw
(Continued on page 328)



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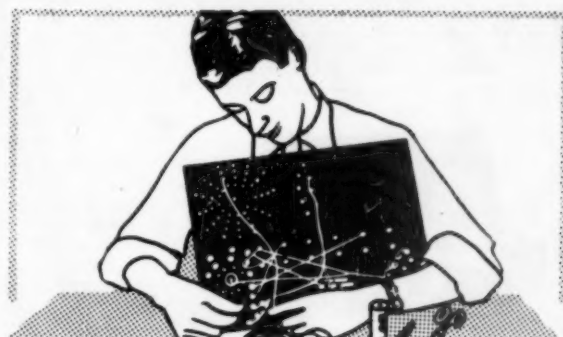
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- Manual "Brainiacs—Small Electric Brain Machines—Introduction and Explanation" by Edmund C. Berkeley, 1959.
- "Introduction to Boolean Algebra for Circuits and Switching" by Edmund C. Berkeley.
- "How to Go from Brainiacs and Geniacs to Automatic Computers" by Edmund C. Berkeley.
- List of references to computer literature including "Minds and Machines" by W. Sluckin, published by Penguin Books (Baltimore), 1954, 233 pages, and other references.

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Space-Age Santa

(Continued from page 326)

puzzles. From two and three to about eight—tinker toys and similar materials.

From nine to 12—chemistry sets. At 10 and 11—microscopes and microscope accessories and materials.

Other suggestions—planetarium, radio kit, optical kit, atomic energy laboratory kit, steam engine and models of planes.

From six years old on—encyclopedias. From about second grade on—books on specific fields such as birds, insects, stars, geology, mathematics, archaeology and chemistry. Science fiction for older children.

High school—well-known science magazines such as SCIENCE NEWS LETTER, Scientific American, Science Digest, National Geographic, Popular Science, Natural History, and the journals published in specialized science disciplines.

Hundreds of ideas for unusual and appropriate gifts can be discovered in Science Clubs of America's files of interesting materials and stimulating information for young scientists. "Shopping" through these files turns up such items as these (catalogs or descriptive literature available from the organizations listed):

FOR THE YOUNGEST: Nature games with birds, butterflies, trees, shells, etc., \$1.35 a game; a wall chart of the solar system and moons, 50¢. (Naturegraph Co., San Martin, Calif.)

Nature charts of seeds, leaves, twigs, tracks, amphibians, etc., 25¢ each; bulletins on forecasting the weather, nature photography, life in a pond, 15¢ each. (National Audubon Society, 1130 Fifth Ave., New York 28, N.Y.)

Miniature "farm" to plant, water, cultivate, Grow-a-Farm, \$3. (In stores, Grow-a-Farm made by Herne Co.)

Coloring book of the Smithsonian Institution, 50¢; Adventures in Science at the Smithsonian, 25¢. (Smithsonian Institution, 10th and Independence Ave., S.W., Washington 25, D.C.)

Science toy collections, \$2 to \$3.50, include such items as a gyroscope, magnetic discs, jumping tops, periscope, kaleidoscope, puzzles, etc. (Science Materials Center, 59 Fourth Ave., New York 3, N.Y.)

D-Stix construction kits; 230, 370 or 452 pieces of colored wood sticks with rubber joints, at \$3, \$5 and \$7 postpaid. (Edmund Scientific Co., 101 E. Gloucester Pike, Barrington, N.J.)

Bird watcher kit, plastic bird house and feeding station to assemble, picture window in house. (In stores, made by Kap-Pak Products.)

The Visible Man, complete human anatomy, 3-dimensional, about \$5 in stores.

Flash cards for addition, subtraction, etc., fractions, number concepts, phonetics, vocabulary at various levels, \$1 up in stores. (Milton Bradley, also other companies.)

Ant Farm, for observation of ant life and habits, about \$3 in stores.

Chic-u-bator, \$5, or Chick-nik, \$4, for

observation of hatching process from egg to chicken, in stores.

Books on successfully raising small animals, such as The Care of Turtles and Small Alligators, 20¢ (N.Y. Zoological Society, Bronx Park, New York 60, N.Y.); Keep Them Alive, \$1 plus postage; free price list of pet reptiles and relevant publications. (Ross Allen's Reptile Institute, Silver Springs, Fla.)

Subscription to monthly Science Program consisting of package of paperback book on some field of modern science, color photographs for mounting, other special material, \$1 a month for as long as desired. (Science Program, Dept. 9.NR-0, Garden City, N.Y.)

Space kit, chart of solar system and infographic wheel which answers questions about planets, \$1; weather kit explaining weather terms, aids for weather prediction, color map, \$1. (In stores or from C. S. Hammond Co., 515 Valley St., Maplewood, N.J.)

Compressed air rocket launcher, \$5. (In stores, made by Knickerbocker.)

Cape Canaveral missile base with rockets, satellites, launching pads, recording of count-down sounds, booklet, \$8. (In stores, made by Marx.)

Westinghouse atomic power plant model, \$7; nuclear submarine that fires Polaris missiles, booklet, \$2; space station, \$5; B-52 carrying X-15 under wing to launch at designated altitude, \$2. (In stores, made by Revell.)

For expert advice on the best among the many attractive new science books for children: The Elementary School Science Library, annotated catalog of 160 books, 25¢, (American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D.C.); Growing Up With Science Books, annotated list of 200, 10¢. (Library Journal, SCA, 62 W. 45th St., New York 36, N.Y.)

"Things of science" kits, such as optical illusion, lenses, paper making, cryptography, crystallization, atomic energy, etc. 75¢ each, yearly subscription for monthly units, \$5. (SCIENCE SERVICE, 1719 N Street, N.W., Washington 6, D.C.)

An excellent source of information about what teen-aged students want most is the "Wish Lists" made by the 320 finalists at the 10th National Science Fair. These Wishes indicated the materials and books they would choose as their Wish Awards if declared winners at the national event.

More than a third wanted electronic equipment such as oscilloscope, VTVM, VOM, and receiver and amplifier kits; tape recorders; Geiger counters; and radios. More than one-fourth of them wished for scientific books in their special fields, encyclopedias and dictionaries. More than 21% wanted microscopes, optical accessories and supplies, binoculars or telescopes. Another 18% listed laboratory supplies and accessories, 11% photographic equipment,

(Continued on page 332)

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ALBERT EINSTEIN—Arthur Beckhard—*Putnam*, 126 p., illus. by C. Beck, \$2.50. Biography for young people.

AMERICA IN THE ANTARCTIC TO 1840—Philip I. Mitterling—*Univ. of Ill. Press*, 201 p., \$5. Documented geographical history.

AMERICAN UNIVERSITIES AND FEDERAL RESEARCH—Charles V. Kidd, foreword by Paul E. Klopsteg—*Belknap Press*, 272 p., \$6. Examines effects of federal money on kind and quality of research done.

ANIMAL TRAVELERS—Marie Neurath—*Sterling*, 36 p., illus. by Isotype, \$2. Informative picture book on migrations for children.

THE ARMCHAIR SCIENCE READER—Isabel S. Gordon and Sophie Sorkin, Eds.—*Simon & Schuster*, 832 p., \$7.95. An anthology of selections from scientific articles, biography and poetry, all concerned with the world of science.

ATOMIC ENERGY IN THE COMMUNIST BLOC—George A. Modelski—*Melbourne Univ. Press (Cambridge Univ. Press)*, 226 p., \$5.50. Surveys and assesses what is known about industrial nuclear developments in Soviet bloc.

ATOMIC ENERGY IN THE SOVIET UNION—Arnold Kramish, Rand Corp.—*Stanford Univ. Press*, 232 p., \$4.75. Comprehensive report of the history, present scope, and future possibilities of Russian nuclear research.

AUTOMATIC TEACHING: The State of the Art—Eugene Galanter, Ed.—*Wiley*, 198 p., \$3.25. Conference papers discussing the technique of teaching by machine.

BEES AND WASPS—Valerie Swenson—*Maxton Pubs.*, 30 p., illus., 69¢. Accurate and colorful science book for boys and girls.

BIOPHYSICAL SCIENCE: A Study Program—J. L. Oncley, Ed.—*Am. Physical Soc. and Wiley*, 610 p., illus., \$6.50. Emphasizes blending of concepts and methods of physical science with those of life science in the study of biological problems.

BOBWITE from Egg to Chick to Egg—Elizabeth and Charles Schwartz—*Holiday House*, 48 p., illus., \$2.50. Life-cycle story for young readers.

BORON HIGH ENERGY FUELS: Hearings and Report—House Committee on Science and Astronautics—*U.S. Congress, Comm. on Science & Astronautics*, 151 p., paper, single copies free upon request direct to publisher, Washington 25, D. C.

COLLEGE ARITHMETIC—W. I. Layton—*Wiley*, 200 p., \$3.50. For student entering college without any background in arithmetic.

THE COLLEGE HANDBOOK, 1959-61—S. Donald Karl, Ed.—*College Entrance Examination Bd.*, 556 p., paper, \$2. Describes colleges, their programs of study, terms of admission, expenses and scholarships.

CONTROLS FOR OUTER SPACE and the Antarctic Analogy—Philip C. Jessup and Howard J. Taubenfeld—*Columbia Univ. Press*, 379 p., illus., \$6. Defines the economic, strategic and political issues, and explores the problems and opportunities of international control.

ELECTRICAL GENIUS: Nicola Tesla—Arthur J. Beckhard—*Messner*, 192 p., \$2.95. Biography for young people.

ENGINEERING MECHANICS: Statics—Irving H. Shames—*Prentice-Hall*, 303 p., illus., \$6.35. Vector treatment of mechanics.

EXPERIMENTS AND PROBLEMS IN GENERAL CHEMISTRY—A. W. Laubengayer—*Rinehart*, 311 p., illus., paper, \$4.50. Laboratory manual and problem book.

EYE, FILM, AND CAMERA IN COLOR PHOTOGRAPHY—Ralph M. Evans—*Wiley*, 410 p., illus., \$8.95. Shows what the differences are between what the eye sees and what camera and film render, and how the photographer can make use of this knowledge.

EYES, VISUAL ANOMALIES, AND THE FUNDAMENTAL READING SKILL—Earl A. Taylor—*Reading & Study Skills Center*, 204 p., illus., paper, \$5. Explains the use of instrument techniques.

FROM HIROSHIMA TO THE MOON: Chronicles of Life in the Atomic Age—Daniel Lang—*Simon & Schuster*, 496 p., \$5.95. About individuals and their reactions.

THE FIRST BOOK OF BELLS—Helen Jill Fletcher—*Watts, F.*, 69 p., illus. by Marjorie Auerbach, \$1.95. Facts and legends.

THE GARDEN FLOWERS OF CHINA—H. L. Li—*Ronald*, 240 p., illus., \$6.50. History of peonies, chrysanthemums and other flowers of Chinese origin.

GEM TESTING—B. W. Anderson—*Emerson Bks.*, 2nd ed., 324 p., illus., \$11.50. Fully revised text.

GROWTH DIAGNOSIS: Selected Methods for Interpreting and Predicting Development from One Year to Maturity—Leona M. Bayer and Nancy Bayley—*Univ. of Chicago Press*, 241 p., illus., \$10. Tables and charts of growth data.

A GUIDE-BOOK TO BIOCHEMISTRY—Kenneth Harrison—*Cambridge Univ. Press*, 150 p., \$3.50. Short introductory text.

HIGH ENERGY RATE METAL FORMING—Glen N. Rardin and others—*Lockheed Aircraft Corp. (Off. of Tech. Serv.)*, 70 p., illus., paper, \$1.75. Report on tests performed.

HIGHWAYS TO TOMORROW—Bill and Sue Sevcern—*Prentice-Hall*, 109 p., illus. by H. Billings, \$2.95. About road construction and electronic highways.

HUMAN HEREDITY—Ashley Montagu—*World Pub. Co.*, 297 p., illus., \$5. Facts about heredity, clarifying some prejudices, includes list of inherited disorders, glossary and bibliography.

THE IMPORTANCE OF WEARING CLOTHES—Lawrence Langner, introd. by James Laver—*Hastings House*, 349 p., 300 illus., \$7.50. Treatise on the psychology behind mankind's creation of clothes.

THE INSECT WORLD: Ants, Bees, Wasps, Butterflies and Many Other Insects—Norman M. Lobsenz—*Golden Press*, 56 p., illus., \$2. Illustrated with color photographs.

INTRODUCTION TO THEORETICAL METEOROLOGY—Seymour L. Hess—*Holt*, 362 p., \$8.50. Covers meteorological thermodynamics, statics, hydrostatic stability, atmospheric radiation, hydrodynamics and circulation.

JOHN DEWEY: Dictionary of Education—Ralph B. Winn, Ed., foreword by John Herman Randall, Jr.—*Philosophical Lib.*, 150 p., \$3.75. Compilation of Dewey's theories and statements on education.

THE LAUGHING BIRD—Anita Hewett—*Sterling*, 32 p., illus. by Anne Marie Jauss, \$2.50. For the youngest readers.

MAKING ELECTRICITY WORK—John M. Ken-

ned—*Crowell*, 213 p., illus. by author, \$3.50. Explains principles of electricity and magnetism, and shows child how to build useful devices.

MARITIME ORGANIC MODERATED AND COOLED REACTOR—*Atomics International—AEC (Off. of Tech. Serv.)*, unpag., illus., paper, \$3.50.

THE MOON: Our Neighboring World—*Otto Binder—Golden Press*, 56 p., illus. by G. Solonovich, \$2. Easy-to-read science book for boys and girls.

MOON BASE—William Nephew and Michael Chester—*Putnam*, 72 p., illus. by W. Bucher, \$2.75. Imaginative narrative for children.

90° SOUTH: The Story of the American South Pole Conquest—*Paul Siple—Putnam*, 384 p., illus., \$5.75. Of the 18 men who were the first human beings to winter at the South Pole, while building the American base there.

NO STONE UNTURNED: An Almanac of North American Prehistory—*Louis A. Brennan—Random House*, 370 p., illus., \$5. For the general reader.

NOBEL: A Biography of Alfred Nobel—*Nicholas Halasz—Orion*, 283 p., \$4.50. Contains some hitherto unpublished material.

THE OCEAN OF AIR—*David I. Blumenstock—Rutgers Univ. Press*, 457 p., \$6.75. Study of the atmosphere, its climate, its weather, and its significance to man.

OCEANOGRAPHIC SURVEY OF THE CONTINENTAL SHELF AREA OF SOUTHERN CALIFORNIA—*Robert E. Stevenson, Dir.—State Water Pollution Control Bd. (Calif. State Print. Div.)*, 561 p., illus., \$4. Interim report on technical aspects of the marine disposal of sewage.

ON FOOT TO THE ARCTIC: The Story of Samuel Hearne—*Ronald Syme—Morrow*, 187 p., illus. by W. Stobbs, \$2.75. Juvenile biography.

OUR WORLD OF SCIENCE—*Duane Bradley and Eugene Lord—Lippincott*, 159 p., illus. by T. Tors, \$3. Explains facts about sound, light, and heat, in simple terms with experiments.

PATRIOT DOCTOR: The Story of Benjamin Rush—*Esther M. Dooty—Messner*, 192 p., \$2.95. Juvenile biography.

PETER FREUCHEN'S STORY ABOUT LIFE IN THE SEVEN SEAS—*Peter Freuchen with David Loh—Messner*, 64 p., illus. by W. S. Bronson, \$3.50. For boys and girls.

THE PREPARATION OF MEDICAL LITERATURE—*Louise Montgomery Cross—Lippincott*, 451 p., illus., \$10. Handbook of practical techniques.

SCIENCE AND RESOURCES: Prospects and Implications of Technological Advance—*George W. Beadle and others, Henry Jarrett, Ed.—Johns Hopkins Press*, 250 p., \$5. Collection of essays.

SECRETS IN THE DUST: The Story of Archaeology—*Raymond Holden—Dodd*, 177 p., illus. by R. Busoni, \$2.75. Tells young people about some outstanding archaeological discoveries.

A SHORT HISTORY OF SCIENTIFIC IDEAS TO 1900—*Charles Singer—Oxford Univ. Press*, 525 p., illus., \$8. Presents in simple form the development of the concept of a material world, all parts of which are rationally interrelated.

SPECTRUM: The World of Science—*Ray Ginger, Ed.—Holt*, 115 p., illus., \$3.95. Beautiful science picture book for adults, with articles by Glenn T. Seaborg, D. B. Steinman and others.

STANDARD HANDBOOK FOR TELESCOPE MAKING—*N. E. Howard—Crowell*, 326 p., illus., \$5.95. Step by step instructions, based on author's experience with teen-age boys in building and using telescopes.

STATISTICAL ABSTRACT OF THE UNITED STATES 1959—*Statistical Reports Div., Bureau of the Census, Edwin D. Goldfield, Chief—Govt. Print. Off.*, 1042 p., \$3.50. 80th edition.

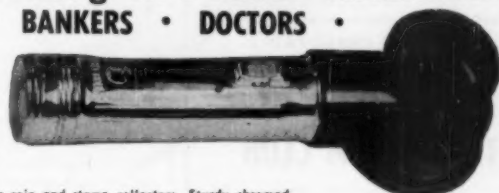
SYMPOSIUM ON BASIC RESEARCH—*Dael Wolfe, Ed.—Am. Assn. for the Advancement of Science*, 308 p., \$3. Addresses and conclusions of Symposium sponsored by NAS, AAAS, and Alfred P. Sloan Foundation.

Science News Letter, November 14, 1959

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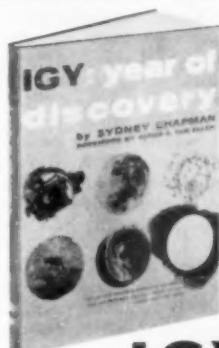


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(Continued from page 328)

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For the chemist: Graduated tubes, to 8ml., flat-bottomed, \$1.50 a doz., R. P. Cargille Laboratories, Inc., 117 Liberty St., New York 6, N. Y.; The Chemical Elements, up-to-date handbook, 55¢ postpaid from SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C.; CHEMISTRY, magazine for chemistry students, teachers, \$4 a year, also from SCIENCE SERVICE.

For a Mathematical Christmas: Brainiac construction kit, \$18.95, from Science Materials Center, 59 Fourth Ave., New York 3, N. Y.; or Berkeley Enterprises, Inc., 815 Washington St., R205, Newtonville 60, Mass.; walnut abacus, \$4.95 from Edmund Scientific Co., 101 E. Gloucester Pike, Barrington, N. J.; subscription to the Duodecimal Bulletin, \$2 for 4 issues, Duodecimal

Society of America, Inc., 20 Carlton Pl., Staten Island 4, N. Y.

For the physicist: Atomotron electrostatic generator kit, \$14.95, Raymaster cloud chamber, \$16, from Atomic Laboratories, Inc., 3086 Claremont Ave., Berkeley 5, Calif.; radioactive isotope price list #14S (no AEC license required), free, and booklet of laboratory experiments with radioisotopes, 50¢, from Atomic Research Laboratory, 10717 Venice Blvd., Los Angeles 34, Calif.; information, prices on booklets and materials for making projectors, solar furnace, etc., from Scientific Laboratory Apparatus, 61 Reade St., New York 7, N. Y.; Fresnel lens for building solar furnace, \$6, replica grating on film for making spectroscopes, \$2, horse shoe magnets for galvanometer, ammeter, etc., \$8.50 each, from Edmund Scientific Co., 101 E. Gloucester Pike, Barrington, N. J.

For the rock hound: Bulletins on ultra-violet fluorescence, luminescence in gem science, 5¢ each, and booklet on rocks and minerals that fluoresce with mineral light, 25¢ from Ultra-Violet Products, Inc., San Gabriel, Calif.; catalogs, lists, information on supplies, minerals, equipment, etc., from Shipley's Mineral House, Gem Village, Bayfield, Colo.; The Prospectors Shop, 201 W. San Francisco St., Santa Fe, N. Mex.; Minerals Unlimited, 1724 University Ave., Berkeley, Calif.; Muciler's 1002 E. Camelback, Phoenix, Ariz.; Gems and Minerals Magazine, Box 687SC, Mentone, Calif.

Science in general: SCIENCE NEWS LETTER subscription, weekly, \$5.50 a year, from SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C.; home laboratory kits, one a month for eight months, include equipment for experiments in sound, electricity, light, etc., \$29.60, from American Basic Science Club, Inc., Box 524, San Antonio, Texas; electric battery motor kit 35¢, horn kit 35¢, bell kit 35¢, small battery motors, 70¢ to \$5, from Polk's Model Craft-Hobbies, 314 Fifth Ave., New York, N. Y.

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Science News Letter, November 14, 1959

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WINDOW CLEANING UNIT consists of a plastic spray bottle and two small



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Science News Letter, November 14, 1959

TWO-WAY TOOTHBRUSH has a small thin sponge mounted along the back part of the bristle base. The sponge is especially designed for massaging gums and polishing

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DRAWING DEVICE can be used to make more than a million different designs, including many geometric figures. Complete with special die-cut paper discs of assorted colors, pencil, and easy-to-follow instructions, the device is also an aid to learning mathematics.

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Science News Letter, November 14, 1959



Nature Ramblings



By HORACE LOFTIN

THE "WISE old owl" perched solemnly on an oak limb, twisting his head from side to side to gaze at the world disdainfully, has long been the symbol of intelligence. But we should take a note from his continual questioning—"who? who? who?"—to figure his true mental accomplishment.

No, the owl is a rather "dumb" bird among birds. This is saying a great deal for, in general, feathered creatures are not noted for their mental acumen. This is so true that when a genuine example of brain power is evidenced, the event often finds itself in the pages of an ornithological journal.

One of the most impressive cases of high avian I.Q. to reach the scientific press concerned a crow in one of the Scandinavian countries. During the winter months, fishermen there cut holes in the ice, drop in baited lines and attach a sort of flag which rises when a fish takes the bait. The crow in question made his living by robbing these ice fishermen of their catches. Here is how he did it:

Bird Brains



The crow waited around the ice holes until one of the flags rose, signifying that a fish was on the line. He would then fly to this line and grab it in his beak at some point near the edge of the ice. Tugging mightily, he would then walk backward with this line as far as he had slack.

From this position, he carefully walked down the line, keeping it under his feet so that it would not slip back into the water, until he reached the edge of the ice again. Another mouthful of line, another backward trip, another tightrope walk down the line to the water's edge again, and he had pulled in that many more inches of line.

The crow thus continued this maneuver until finally he had raised the hooked fish to the surface, whereupon he caught and devoured his prize!

While such an intriguing example of learned behavior can hardly be considered typical of members of the crow family, still the crows in general are popularly and properly credited with one of the highest I.Q.'s among the birds. So true is this that Henry Ward Beecher remarked once that "if men wore feathers and wings a very few of them would be clever enough to be Crows!"

It is often hard to state with certainty whether a given act of apparent intelligence is truly that, or whether it is simply a sort of new twist on some old instinct. For example, there are some birds in England which have "learned" to open the caps of milk bottles left on door stoops, from which they take their morning sip of milk. Did they come by this act by intelligent action or blind luck? Does one bird who has mastered the trick teach it to another? More than the "wisdom" of the old owl would be needed to answer such questions.

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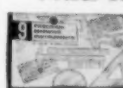


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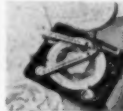
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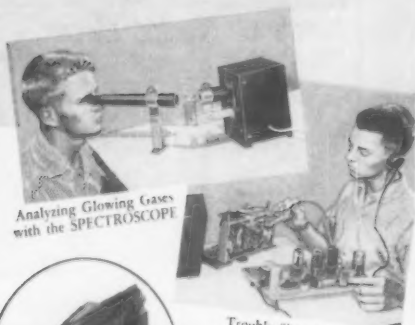
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